Biology of Fleshy Fungi
Botany 360 Lecture
Fall 2017

Instructor: Terry W. Henkel, PhD.
Office: 123 Science B
Telephone: 826-4841
Email: twh5@humboldt.edu
Office hours: Monday & Wednesday 12-2 pm, or by appointment

Meeting times: Mon./Wed. 5-6:50 pm, Science B 128

Course format: Bot. 360 lecture will consist of selected topics concerning the systematics, genetics, ecology, and applications of higher *Basidiomycota*. The lectures are designed to complement the laboratory portion of the course, which emphasizes identification of Northern California mushrooms. No textbooks are required for Bot. 360 lecture.

Moodle: Regular use of Canvas is REQUIRED of all students in Bot. 360. Lecture outlines, powerpoint presentations, lab handouts, reading assignments, and other items will be available (sometimes exclusively) through Moodle.

Readings: Periodically, journal articles, book chapters, and other readings will be assigned. To foster critical thinking in mycological research, students are expected to read these materials, understand their empirical aspects, and be able to discuss them; there will be questions drawn from the readings on examinations.

Examinations: There will be three lecture examinations, the content and conceptual aspects of which will be drawn from the preceding series of lectures as well as relevant and discussed aspects of assigned readings.

Grades: A student's grade will consist of scores from three lecture exams.

Examination	Dates	Points
1	November 6	100
2	November 27	100
3	December 15	100
	Total=	300

Grades are based on percentage of total points as follows:

% total points	Grade	% total points	Grade
100-93	A	77.9-73	C
92.9-90	A-	72.9-70	C-
89.9-88	B+	69.9-68	D+
87.9-83	B	67.9-60	D
82.9-80	B-	≤ 59.9	F
79.9-78	C+		

Curve: Grades will be scaled at the end of the semester based on the highest score achieved in the class (i.e. the highest score will form the 100% mark).

Schedule:

Date	**Topic**
Oct 16	Introduction; *Basidiomycota*: contemporary classification
Oct 18	*Basidiomycota*: life cycles and mating systems
Oct 23	Basidioma form and function
Oct 25	Molecular systematics and the evolution of basidioma form
Oct 30	Nutritional ecology of basidiomycetes
Nov 1	Wood decomposition
Nov 6	***Lecture Examination #1***
Nov 8	Litter decomposition
Nov 13	Ectomycorrhizae
Nov 15	Fungal bioremediation
Nov 20/22	*no class - holiday*
Nov 27	***Lecture Examination #2***
Nov 29	Mushroom toxins
Dec 4	Medicinal mushrooms
Dec 6	Ethnomycology
Dec 15	***Final Lecture Examination 3:00-4:50 pm***

Important Dates Fall 2017:

August 27: *Deadline* – **ADD** open courses without instructor approval
September 4: *Deadline* – Last day to **ADD** courses by 11:59 pm with instructor approval; *Deadline* – Last day to **DROP** courses, by 11:59 pm; after this date a serious and compelling reason to drop is required, along with the

instructor's & department chairs' signatures, a $20 fee, and a "W" grade will be recorded; *Deadline* – Last day to change registered class grade option to **AUDIT**

For full important dates, see: http:// http://pine.humboldt.edu/registrar/pdf/CalendarOfActivitiesF17.pdf

Additional notes – Incompletes & Unofficial Withdrawals:

→An incomplete (I) is given only when extenuating circumstances prevent a student from completing work in the course; earlier exam scores stand unchanged. Per University policy, an "I" grade remaining incomplete after one year will automatically be changed to "F".

→Students who stop attending and do not drop the class will not get an Incomplete. The latter will receive a grade of **Unofficial Withdrawal**. For the purposes of grade point average, a grade of "W" is equivalent to an "F". In fact, a "W" may be worse than an "F" for those students who wish to repeat the course later. Petitions to replace a grade earned in this course with a better grade may be denied if the student has withdrawn from this course unofficially.

Biology of Fleshy Fungi
Botany 360 Lab
Fall 2017

Instructor: Terry W. Henkel, PhD.
Office: 123 Science B
Telephone: 826-4841
Email: twh5@humboldt.edu
Office hours: Monday & Wednesday 12-2 pm, or by appointment

Meeting times: 8-10:50 am Mon & Wed, Science B 128 (begins Oct. 16)

Required Textbooks and Keys:

How to Identify Mushrooms to Genus I. Macroscopic Features. D.L. Largent
How to Identify Mushrooms to Genus VI. Modern Genera. D.L. Largent & T.J. Baroni
Mushrooms of the Redwood Coast: A Comprehensive Guide to the Fungi of Coastal Northern California. Noah Siegel & Christian Schwartz

Books 1-3 will be available from the instructor; payment in full *must* be received by Wed. Oct. 25

Optional field guides:

California Mushrooms. D.E. Desjardin
Mushrooms Demystified. David Arora

Required equipment:

1) 10 X handlens, Bausch and Lomb preferred. Order from:
http://www.forestry-suppliers.com/product_pages/View_Catalog_Page.asp?ID=5250
2) Mushroom collecting basket
3) Wax paper bags for larger collections
5) Plastic fishing tackle boxes for small to medium-sized collections
6) Pocket knife
7) Clean, unlined white paper for spore prints

Note that you will also need adequate field clothing to withstand continuous hours of exposure to the elements, in particular rain + cool temperatures, during scheduled field trips and personal collecting sessions.

Course Objectives: Bot. 360 Lab will allow students to develop the skills necessary to identify families, genera, and selected common species of fleshy fungi of Northern California. The field orientation will facilitate student understanding of the ecological relationships of higher *Basidiomycota*, including recognition of plant community composition, presence or absence of

ectomycorrhizal trees, microhabitat, and decomposer substrata as indicators of fleshy fungal community composition.

Format: The laboratory for Bot. 360 provides the student with robust field and laboratory experience in identifying fleshy fungi of Northern California, as well as interpreting their ecological relationships. The first four lab sessions (Oct. 16, 18, 23, 25) will provide introductory material in macrofungal collecting protocols, morphology and classification schemes, and use of keys. Beginning Oct. 30 the laboratory will function as follows: **8-8:30 am**: quizzes on scheduled dates; **8:30-10:50 am**: verification of student collections; review of families and genera. Assessment will consist of lab quizzes, field examinations, and points associated with student collections. All quizzes and exams will be based on fresh macrofungal specimens collected in the field.

Required Field Trips: The field trips provide the core experience in field mycology for the students. Extensive face time with the instructor in wild natural communities in search of the "elusive fungus" allows for direct hands-on learning in nature's laboratory. In addition to refining their fungal search images and recognizing habitat/species relationships, students will take exams based on oral delivery of questions from the instructor in the field, based on material and ecological situations directly at hand.

Sat/Sun	*Date*	*Potential location*
Sat.	Oct 28	Big Lagoon (coastal)
Sat.	Nov 4	East Fork Trinity, Greys Falls (inland)
Sat.	Nov 11	Skunk Cabbage Trail (coastal)
Sat./Sun.	Dec 2/3	Smith River (inland)
Sat./Sun. (optional)	Nov 18/19	Fungus Fair, Redwood Acres, Eureka

Quizzes & examinations:

Examination	Date (s)	points
Quiz (20 pts. each)	Nov 6; Nov 15; Nov 27	60
Field Exam 1	Nov 11	50
Field Exam 2	Dec 2/3	100
Collection		100
	total points =	310

Grading scale:

% total points	Grade	% total points	Grade
100-93	A	77.9-73	C

92.9-90	A-	72.9-70	C-
89.9-88	B+	69.9-68	D+
87.9-83	B	67.9-60	D
82.9-80	B-	≤ 59.9	F
79.9-78	C+		

Schedule:

Date	**Topic**
Oct. 16	Introduction
Oct. 18	Trip to Arcata Community Forest; collecting protocols, spore prints
Oct 23	Macroscopic features; stature types; uses of required textbooks
Oct. 25	Uses of keys; practice identification of student collections; keying
Oct. 28 (Sat)	***Field trip***
Oct. 30	Begin checking and discussing student collections
Nov. 1	Check and discuss student collections
Nov 4 (Sat)	***Field trip***
Nov 6	***Quiz***; check and discuss student collections
Nov 8	Check and discuss student collections
Nov. 11	***Field trip, field examination***
Nov 13	Check and discuss student collections
Nov 15	***Quiz***; Check and discuss student collections
Nov 18-19	*Fungus Fair*
Nov 20/25	*No labs - holiday*
Nov 27	***Quiz***; Check and discuss student collections
Nov. 29	Check and discuss student collections
Dec 2/3 (*Sat/Sun*)	***Overnight field trip, field examination***
Dec 4	Check and discuss student collections
Dec 6	Check and discuss student collections

Expections:

Students will be expected to recognize families and genera, and selected easily identified, common, edible or toxic species of fleshy fungi, macroscopic morphological features important in mushroom identification, and interpretation of fungal-related ecological situations in the field.

The list of required families, genera and species will be periodically updated as the collecting season progresses. Laboratory and field examinations will cover this list.

Collections:

You are required to collect mushrooms for each lab meeting and to identify each collection to genus. Your grade in the lab course will be affected by how many different genera distributed among different families that you identify over the semester. You will get credit by having each correctly identified genus on the family synopsis sheet signed by an instructor. Additionally, some collections may be keyed out to the species level using the newly available "Keys to California Mushrooms".

Miscellaneous comments on collections:

The first time you want an identified genus to be initialed on your family/genus synopsis sheet, you will have to have:

- spore print or some verification of spore color
- stature type of collection;
- family name for collection;
- the key step numbers you used from Mushrooms I & VI
- the Friesian genus
- the Modern genus

You can go on collecting trips together, but you cannot "share" collections. Collections thought to be shared by the verifier will not count regardless if correctly identified.

All collections have to be in excellent condition and consist of various stages of basidioma development.

To get the full amount of points on the collection (100), you must have at least 50 correctly identified genera. The numbers of genera required within each family are noted in parentheses next to the family on the check-off sheet. The total number of required genera may be lowered depending on the quality of the collecting season and discretion of the instructor. A system for additional credit for collections keyed out to species will be worked out by the instructor.

Important Dates Fall 2017:

August 27: *Deadline* – **ADD** open courses without instructor approval
September 4: *Deadline* – Last day to **ADD** courses by 11:59 pm with instructor approval; *Deadline* – Last day to **DROP** courses, by 11:59 pm; after this date a serious and compelling reason to drop is required, along with the instructor's & department chairs' signatures, a $20 fee, and a "W" grade will be recorded; *Deadline* – Last day to change registered class grade option to **AUDIT**

For full important dates, see: http:// http://pine.humboldt.edu/registrar/pdf/CalendarOfActivitiesF17.pdf

Additional notes – Incompletes & Unofficial Withdrawals:

→An incomplete (I) is given only when extenuating circumstances prevent a student from completing work in the course; earlier exam scores stand unchanged. Per University policy, an "I" grade remaining incomplete after one year will automatically be changed to "F".

→Students who stop attending and do not drop the class will not get an Incomplete. The latter will receive a grade of **Unofficial Withdrawal**. For the purposes of grade point average, a grade of "W" is equivalent to an "F". In fact, a "W" may be worse than an "F" for those students who wish to repeat the course later. Petitions to replace a grade earned in this course with a better grade may be denied if the student has withdrawn from this course unofficially.